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# NAVAL POSTGRADUATE SCHOOL
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# THESIS

A MANAGEMENT CASE ANALYSIS
OF THE DEPARTMENT OF DEFENSE
CONTRACTOR RISK ASSESSMENT GUIDE PROGRAM

by

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December 1990

Thesis Advisor: Paul M. Carrick



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A Management Case Analysis
of the Department of Defense
Contractor Risk Assessment Guide Program

by

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Submitted in partial fulfillment
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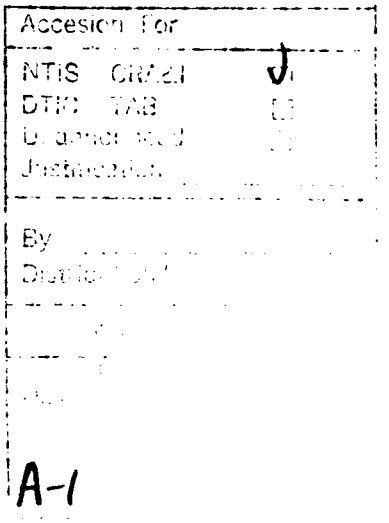
**ABSTRACT**

This thesis investigates the extent to which the Contractor Risk Assessment Guide (CRAG) Program at General Dynamics in San Diego, California, is achieving the goal of improved Department of Defense oversight processes and more effective contractor internal control systems. The study describes the development, reviews the basic audit procedures, and examines the five chapters of the CRAG Program. The research demonstrates that reduced duplication of effort was attained at General Dynamics' San Diego divisions through coordinated statistical sampling and audit planning. The environment created by the CRAG Program has resulted in an improved relationship between General Dynamics and government oversight personnel. The study concludes that the CRAG Program is an effective method to promote self-governance in the defense industry and recommends continued support from both industry and the Department of Defense.



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# I. INTRODUCTION

## A. GENERAL

In June 1986, the President's Blue Ribbon Commission on Defense Management (Packard Commission) published its final report. One of its conclusions was that contract violations would be reduced if government contractors established more effective internal controls [Ref. 1:p. 80]. To improve corporate controls, the Commission recommended:

> ...promulgation and enforcement of more effective internal control systems....establishment of a more effective oversight of the entire process by an independent committee... [Ref. 1:p. 81]

In response to the Packard Commission Report, the Contractor Risk Assessment Guide (CRAG)[1] Program was implemented in November 1988 through a joint effort of the Defense Contract Audit Agency (DCAA), Department of Defense Inspector General (DODIG), Department of Defense (DOD) acquisition community, and the defense industry, as represented by the Council of Defense and Space Industry Associations (CODSIA). [Ref. 2:p. i]

The CRAG Program focuses on high-risk areas which account for the majority of problems in government contracting. At the time of this thesis, five high-risk areas have been developed into chapters for the CRAG: [Ref. 2:p. 1]

---

[1]Abbreviations and acronyms frequently used throughout this thesis may be found in Appendix A.

- Labor Charging,
- Materials Management and Accounting Systems,
- Indirect Cost Submissions,
- Estimating Systems, and
- Purchasing.

The program is voluntary. First, the contractor must decide if and to what extent he will participate. Then the contractor, Administrative Contracting Officer (ACO), and the appropriate DOD oversight activity will work together to ascertain the reliability of the contractor's system of internal controls. The contractor must be able to describe and document the policies, controls, training program, and test and monitoring procedures which define the system for the applicable CRAG risk areas. Finally, if the government finds the contractor's internal controls to be acceptable, it may rely on contractor audit results to: [Ref. 3:p. 15]

- reduce oversight,
- shift manpower to areas such as contract close-out which may benefit the contractor, or
- shift oversight resources to known problem areas.

The expense of implementing the CRAG Program may vary significantly depending on the quality of a contractor's internal control systems. Contractors with strong internal control systems may require little more than a demonstration of their systems and coordination with government representatives.

Potential financial benefits to the contractor may also vary significantly. When government oversight is reduced, those contractor employees who were required to prepare information, coordinate, and monitor government auditors are released to perform productive activities. In addition, government auditors may use audit hours saved by CRAG participation to expedite audits which accelerate contract close-out. Large businesses may receive progress payments not exceeding 80 percent of the total costs incurred. As a result, final close-out payments may be significant. General Dynamics' southern California divisions recorded costs of over $640 million in 1989 [Ref. 4:p. 1]. At ten percent simple interest, a one year delay in contract close-out could cost the corporation almost $13 million.

A contractor is not assured of reduced oversight by participation in the CRAG Program. Reduced oversight and other potential benefits depend upon the degree to which the government is able to rely on a contractor's internal control system. Without a guarantee, many contractors are hesitant to participate. During the early development of CRAG, the following concerns were frequently articulated to government representatives: [Ref. 5:p. 2]

- little industry confidence DOD will actually reduce oversight,
- lack of trust between contractors and DOD,
- potential or perceived benefits don't justify the cost to implement,

- differences between the DOD understanding and commitment at Headquarters' locations versus contractor site locations, and
- perceived coordination difficulties among the government team.

On 8 August 1990, the Director, DCAA described the progress made by the CRAG Program. Speaking at a seminar given to the Association of Internal Auditors, he estimated that CRAG participation by a sample of five defense contractor divisions would result in fiscal year 1991 DCAA staff reductions of almost 18,000 auditing hours representing about 12 staff man years [Ref. 5:p. 5]. In addition to reduced oversight, the DOD CRAG Program Steering Group described the value of the program as follows: [Ref 2:p. i]

> The value of the CRAG Program to both government and industry is that it is a long-term program with a goal of improving the DOD oversight and procurement processes and enhancing the image of government contracting in the eyes of the Congress and the public.

Despite the apparent success stories, some contractors still believe the CRAG Program will lead to increased government oversight and escalating costs to defense contractors. For those contractors, more evidence is needed. This thesis will examine the evidence available and hypothesize the net worth of the CRAG Program.

## B. OBJECTIVE OF RESEARCH

The objectives of this study are to: (1) ascertain what impact the CRAG Program has had on contractor internal control systems and related government oversight of those systems, (2)

determine if the benefits justify the cost of implementation both to the government and participating contractors, and (3) identify those aspects of CRAG implementation which may be analogous among all participants.

## C. SCOPE OF THESIS

This thesis is limited to a case analysis of CRAG implementation at the San Diego, California, divisions of a major defense contractor. The study employs comments and opinions of key government and defense industry officials to make inferences regarding the overall effectiveness of the CRAG Program.

## D. RESEARCH QUESTIONS

To achieve the stated objective, the following primary research question is presented: To what extent is the CRAG Program achieving the goal of improved DOD oversight processes and more effective contractor internal control systems?

In support of the primary question, the following subsidiary questions were established:

- What are the essential features of the CRAG Program as it currently exists and how has the program been implemented?
- To what extent has the CRAG Program changed the internal control systems of General Dynamics' San Diego divisions?
- To what extent has the CRAG Program changed Department of Defense oversight for General Dynamics' San Diego divisions?
- What benefits and costs have resulted from the CRAG Program at General Dynamics' San Diego divisions?

- Which elements of the CRAG Program at participating General Dynamics divisions are common to all CRAG participants?

- What inferences may be made from the experience of General Dynamics' San Diego divisions which could be used by other contractors wishing to implement the CRAG Program?

- What level of support has been demonstrated for the CRAG Program by government and industry?

## E. RESEARCH METHODOLOGY

The primary source of information presented in this study was obtained from on-site visits and interviews with representatives of General Dynamics' San Diego divisions, the cognizant Defense Plant Representative Office (DPRO), and the on-site DCAA representative.

Supporting information was obtained from telephone interviews and correspondence with representatives of the Defense Contract Management Command (DCMC), DCAA, DODIG, Under Secretary of Defense for Acquisition (USDA), CODSIA, Electronic Industries Association (EIA), and the Aerospace Industries Association (AIA). Current articles in professional journals and publications were reviewed as another source of research data in addition to speeches delivered to the July 1990 National Contract Management Association (NCMA) National Education Conference, and the August 1990 Institute of Internal Auditors CRAG Implementation Update Conference.

## F. ORGANIZATION OF THE STUDY

This study consists of six chapters. Chapter I contains the introduction and research questions in addition to providing comment on the scope, purpose, and research methodology of the study. Chapter II provides background information for the entire CRAG Program and specific background for the contractor being studied. Chapter III describes the essential features of the CRAG Program and internal audit standards.

Chapters IV and V contain the primary research results. Chapter IV identifies some of the effects of CRAG Program implementation experienced by General Dynamics' San Diego divisions and the government. Chapter V analyzes potential costs, benefits, and threats related to implementation of the program.

Chapter VI provides conclusions derived from the research and recommendations for future study of the CRAG Program. Appendices and a List of References are provided for information and to facilitate further research in this area.

## II. BACKGROUND

### A. CRAG PROGRAM HISTORY

In 1985, the defense industry was plagued by scandals and allegations of fraud and mismanagement. President Reagan established a blue ribbon commission headed by David Packard (Packard Commission) to study, report findings and make recommendations concerning the issues surrounding defense management and organization. The Commission identified four separate areas of study: [Ref. 1:p. xvii] National Security Planning and Budgeting, Military Organization and Command, Acquisition Organization and Procedures, and Government-Industry Accountability. Increased contractor self-governance, which would later be advanced through the CRAG Program, was a primary recommendation of the government-industry accountability study.

> The Commission believes that self-governance is the most promising mechanism to foster improved contract compliance. It follows that each contractor must individually initiate, develop, implement, and enforce those elements of corporate governance that are critical to contract compliance... [Ref. 1:p. 84]

In February 1986, the certified public accounting firm of Arthur Anderson & Company completed a study of DOD contract auditing and oversight. They identified three principal problems which emphasized the need for initiatives such as the CRAG Program:

- there is no coordination between DOD organizations with different audit responsibilities,

- when planning audits, DOD organizations fail to take into consideration contractor's past performance, results of past or ongoing reviews, or the relative costs or benefits of the audit, and

- the ACO, who is responsible for overall coordination of contract administration, no longer functions as the government's "team leader" and has very limited authority to resolve audit recommendations. [Ref. 6:p. 3]

Historically, DOD auditors were assigned responsibility for ensuring contractor compliance with DOD requirements [Ref. 1:p. 80]. In October 1987, the Department of Defense Federal Acquisition Regulation Supplement (DFARS) was changed to hold contractors responsible for their own business practices and to encourage self-governance programs [Ref. 7:p. 3.70].

Partially in response to preceding events, the CRAG Program was initiated by the DODIG's office in early 1988. On 14 March 1988, the program was announced in the Federal Contracts Report, and on 24 March 1988 CODSIA completed a review of the CRAG first draft.

The Secretary of Defense sent letters to over 100 major defense contractors on 9 May 1988 announcing the CRAG program and encouraging support. A series of individual and joint Department of Defense and industry working group meetings culminated in a joint Department of Defense/industry forum on 23 September. The CRAG, as agreed upon by government and industry, was published in October and officially approved by the Secretary of Defense on 30 November 1988.

In a memorandum to heads of contract administration for each of the services, dated 7 February 1989, the Deputy Assistant Secretary of Defense for Procurement [Ref. 8] emphasized the key role of the ACO in keeping records and coordinating CRAG Program participation.

Secretary of Defense Cheney's Defense Management Report to the President of 12 July 1989 encouraged increased industry participation in the CRAG Program [Ref. 9:p. 23]. On 26 July, in a letter to CODSIA, the Director of DCAA [Ref. 10] expressed disappointment with the defense industry's support of the CRAG Program and urged CODSIA to take a leadership role in encouraging its members to participate.

The DCAA [Ref 11:p. 45] informed defense contractors in January 1990 that it would reassign audit hours saved by CRAG Program participation to catch up on the backlog of overhead audits. This provided a cash incentive to contractors since they usually receive final settlement when the contract is closed, but a contract cannot be closed until the overhead audits are completed. In March the Commander of the new DCMC [Ref. 12] requested his regional commanders actively solicit contractor participation in the CRAG Program, and between January and May [Ref. 13:p. 701] the number of participants in the CRAG Program increased from 6 to 13 companies.

A CRAG Implementation Update workshop was sponsored by the Institute of Internal Auditors on 8 August 1990. The workshop featured five top defense contractors who are implementing the

CRAG Program in varying degrees. Government agencies were equally represented. The workshop provided a forum at which contractors and government auditors described their experiences with CRAG Program implementation. The opportunity was also used to encourage greater industry participation. Government agencies and defense industry leaders presented a unified front in their total support of the CRAG Program.

In a letter dated 13 August 1990, [Ref. 14] DCAA's Assistant Director of Policy and Plans reported that 18 major DOD contractors were implementing a portion of the CRAG Program at 42 locations or divisions. Evidence continues to indicate that more contractors will implement the CRAG Program in the future. For example, in a telephone conversation on 17 September 1990, [Ref. 15] DCAA's Western Deputy Regional Director reported a large increase in interest by defense contractors in CRAG Program participation.

## B. GENERAL DYNAMICS CORPORATE INFORMATION

General Dynamics is primarily an aerospace manufacturer which designs, engineers, and manufactures military aircraft, missiles, gun systems, space systems and related subassemblies and components. It also designs and produces a variety of defense electronic systems and products. [Ref. 16:p. 2992]

Other principal business operations include design, engineering, construction and overhaul of submarines; design, engineering, and manufacturing of tanks, land vehicles and other support systems; design, engineering, manufacturing,

and financing of general aviation aircraft; production of commercial space launch vehicles; quarrying of limestone; production of building products; and the mining of coal. [Ref. 16:p. 2992]

On 31 December 1989, General Dynamics employed 102,200 people, posted net sales in excess of $10 billion and had divisions and subsidiaries located in: [Ref. 16:p. 2992]

- San Diego, CA (3),
- Fort Worth, TX,
- Pomona, CA,
- Groton, CT,
- Chicago, IL (2),
- St. Louis, MO (2),
- Sterling Heights, MI,
- Rancho Cucamonga, CA,
- Wichita, KS,
- Quincy, MA, and
- Marion, IL.

In 1989, General Dynamics' Convair division alone posted sales of over $800 million, 80 percent of which were to the U.S. government. [Ref. 4:p. 1]

## C. GENERAL DYNAMICS SELF-GOVERNANCE HISTORY

### 1. Corporate

The General Dynamics Corporation had been fined, suspended, faced accusations of procurement fraud and had government contracts withheld during the period from 1984 to

1986. In response, the company established an industry leading ethics program, an exhaustive review of outstanding overhead claims, special reviews of vulnerable cost areas and a zero administrative defects goal. General Dynamics was a Defense Industry Initiatives (DII) signatory and supported and helped develop the CRAG Program from its inception.

2. **General Dynamics in San Diego**

San Diego divisions also experienced charges of improper procurement practices in 1984. Convair Division, for example, was charged with failure to maintain accurate time card records and to ensure allocation of labor costs to the proper cost objectives. Many of the discrepancies could have been avoided by an effective internal control system and open communication with the government. Since 1986, General Dynamics' major San Diego divisions have increased their use of self-governance through self-reviews and employee training programs.

In addition to corporate internal audit reviews, divisional self-governance activities in CRAG areas include the following:

- Overhead--Prior years' Accounting Data Reviews led to an annual overhead statistical sampling of current year's overhead claim and establishment of a Federal Acquisition Regulation (FAR) compliance board,

- Labor--Improved floorcheck programs,

- Material--Established a Material Management and Accounting Systems (MMAS) Review which included quarterly status to the government in cycle inventories, inventory accuracy self-audits and Bill of Materials (BOM) accuracy reviews,

- Estimating--Implemented spares estimates screening and individual price proposal reviews, and
- Purchasing--Conducted audits of subcontractors including termination claims and close-outs.

Division employee training programs cover labor charging, ethics, new business funds and overhead awareness. Division auditors receive self-governance training in field work, working paper standards, sampling techniques, report writing, and supervision.

## D. GENERAL DYNAMICS AUDIT RELATIONS HISTORY

Prior to the CRAG Program, government access to accounting systems was restricted to areas covered under government-installed retrieval programs. Under the CRAG Program, the government also has access to General Dynamic's retrieval programs. [Ref 4:p. 2]

Before CRAG Program implementation, General Dynamics severely limited DCAA's access to records. Unless specifically requested, even common internal communications such as employee newsletters were not provided to the auditor. The CRAG Program has created an environment where DCAA enjoys expanded access to contractor reports, memorandums, newsletters and other routine documents. The DCAA reports the expanded access allows the audit staff to plan more effectively. Audit efforts may be decreased where General Dynamics' audits have already covered the risk. [Ref. 4:p. 2]

Floorcheck information was treated as proprietary by both government auditors and General Dynamics personnel before CRAG

Program implementation. Due to this limited interreliance, there was significant duplication of effort. The government auditors and General Dynamics now share observers, error rates, reports, trends and leads. [Ref. 4:p. 2]

The DCAA employs over 6,000 auditors. In 1990, 26 of those auditors were assigned full time to General Dynamics' San Diego divisions. General Dynamics employs between 1,500 to 1,600 on-site auditors. Eight are assigned to San Diego. Before the CRAG Program and other self-governance initiatives were implemented, communication between General Dynamics and the government audit staff was very limited. Most of the interaction took place in written form. Now, General Dynamics personnel and the government audit staff hold routine meetings and regularly scheduled quarterly discussion meetings. General Dynamics personnel also attend DCAA regional meetings. [Ref. 4:p. 2]

## E. GENERAL DYNAMICS VULNERABILITY ASSESSMENTS

To determine the risk vulnerability of a particular division, General Dynamics Corporation considers:

- DCAA and corporate internal audit vulnerability assessment procedures (VAPS),
- findings and frequency of prior audits, and
- management trend assessments.

Prior to 1986, government auditors estimated that General Dynamics' San Diego divisions were highly vulnerable to fraud or abuse in indirect costs, labor charging, estimating

systems, and material management and accounting systems (MMAS). Their assessment was based on discrepancies identified in audits and a lack of effective internal control systems at those divisions reviewed. Since 1986, General Dynamics and government personnel have worked closely to come to a mutual assessment and improve the divisions' internal control systems. The DCAA's vulnerability assessments for the five CRAG areas since 1986 are summarized in Table I.

TABLE I

GENERAL DYNAMICS RISK ASSESSMENT BY CRAG AREA SINCE 1986

| | |
|---|---|
| Indirect Costs | Low Risk, |
| Labor Charging | Average Risk, |
| MMAS | Low Risk, |
| Estimating Systems | Average Risk, |
| Purchasing System | Low Risk. |

Source: Defense Contract Audit Agency, General Dynamics, San Diego, CRAG Implementation Notes, 26 March 1990

By 1989, General Dynamics' San Diego divisions' internal control systems were in good condition and provided an excellent opportunity to implement the CRAG Program.

## III. CRAG PROGRAM ESSENTIAL FEATURES AND AUDIT STANDARDS

### A. CRAG PROGRAM PERSONNEL ORGANIZATION

#### 1. Past Government Organization Problems

The Packard Commission recognized the need for improved coordination between DOD agencies and Congress when performing oversight of defense contractors. It noted that no senior official within the Office of the Secretary of Defense (OSD) was working full time to provide overall supervision of the acquisition system. To rectify the problem, the Commission recommended creation of the Under Secretary of Defense for Acquisition (USDA) who would establish contract policy throughout the DOD. The USDA would provide overall coordination to promote efficiency and minimize duplication of effort. [Ref. 1:p. 90-91]

Despite progress, many top level industry executives still list duplicative audits as a major business concern when dealing with the government. [Ref. 17]

> The entire scope of the oversight and audit effort for defense contracts is excessive and needs review and simplification. [Ref. 18:p. 40]

#### 2. Current Government Organization

As the Defense Acquisition Executive (DAE), the USDA advises the Secretary of Defense (SECDEF) on all matters relating to the acquisition system. His primary responsibilities include: [Ref. 19:p. E-2]

- establishing uniform policies and practices governing acquisition programs in general, and specific procedures, documentation requirements, and responsibilities for managing and reviewing major defense acquisition programs,

- assuring that the concepts, policies, and provisions of DOD Directive 5000.1 and OMB Circular A-109, "Major Systems Acquisition," are complied with and effectively administered throughout the DOD, and

- serving as Chairman of the Defense Acquisition Board (DAB).

The Inspector General for the DOD was established in 1982 as an independent and objective official responsible for conducting, supervising, monitoring and initiating audits, investigations and inspections relating to programs and operations of the DOD. In 1986, the Packard Commission recommended the USDA oversee establishment of contract audit policy throughout the DOD [Ref. 1:p. 92]. However, the DODIG has retained overall responsibility for all audit policy for the DOD. DODIG is also responsible for overseeing and reporting the DCAA's implementation of policy. [Ref. 20]

The DCAA is responsible for performing all contract audits for the DOD. It also provides contract audit services to other government agencies, as appropriate. In connection with negotiation, administration, and settlement of contracts, the DCAA provides accounting and advisory services regarding contracts and subcontracts to all DOD components responsible for procurement and contract administration. Advisory services include reviewing the efficiency and economy of contract operations and evaluating the costs claimed or

proposed by contractors. The DCAA is under the direction, authority and control of the DOD Comptroller. [Ref. 20]

All of the military services' plant representative and contract administration offices have been brought under the control of the Defense Contract Management Command (DCMC), which is a component of the Defense Logistics Agency (DLA). The purpose is to streamline DOD contract management by consolidating and standardizing contract administration services. Worldwide engineering and program support, contractor and quality assurance, and contract management support will no longer be managed by different Military Departments and DLA, but will be standardized under DCMC. [Ref. 20]

A simplified organizational chart of key government organizations in the contractor audit process is provided in Figure 1.

### 3. The Contractor's Organization

Figure 2 is a simplified organizational chart of the General Dynamics Corporation. Its various divisions and subsidiaries produce a diverse group of products and services requiring different accounting procedures which make it difficult to compare CRAG Program benefits and costs. To provide a common frame of reference, this study will focus on four closely related General Dynamics divisions located in San Diego, California: Convair, Space Systems, Electronics, and Western Data Center.

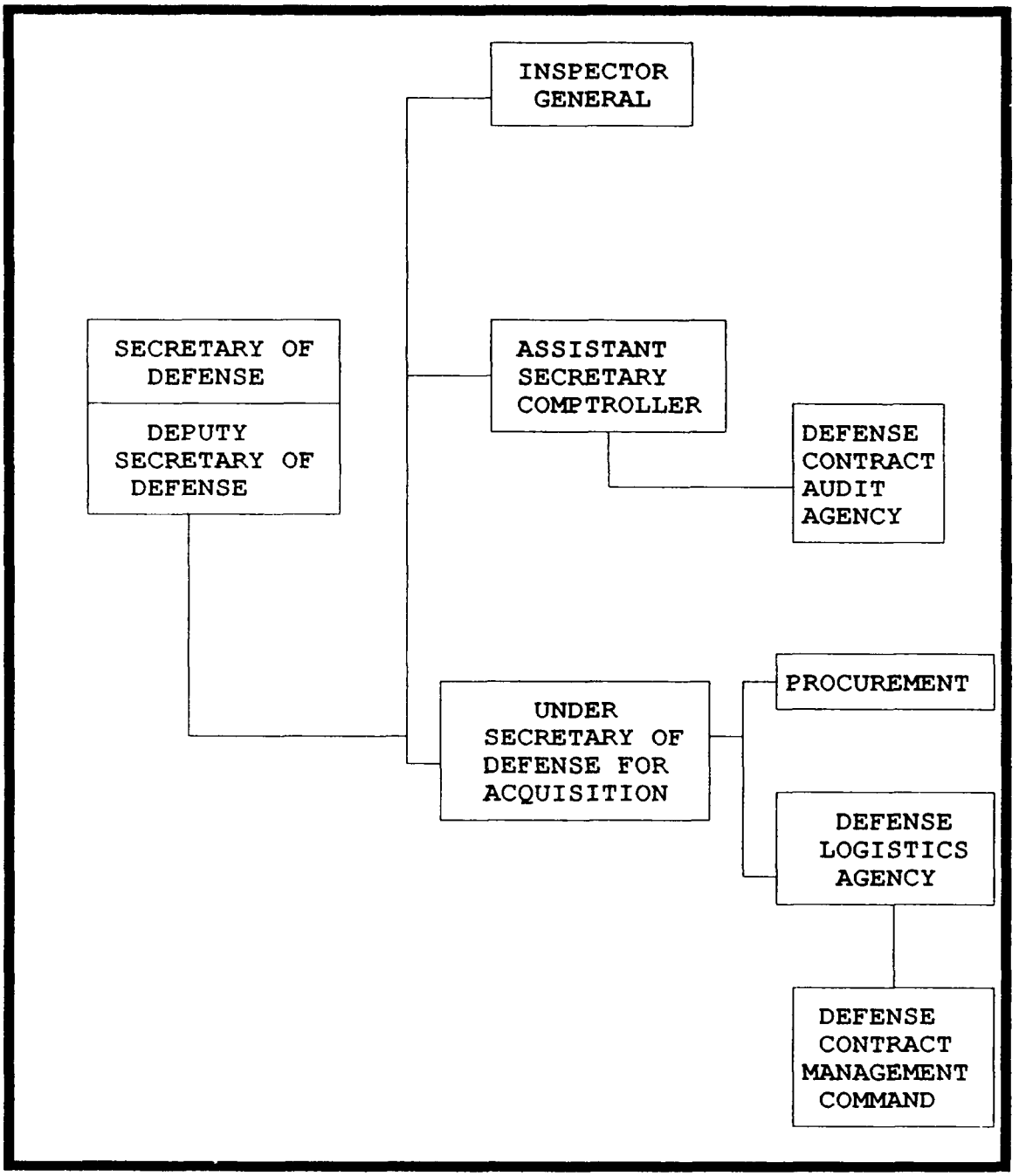


Figure 1. Key Government Organizations in the Contractor Audit Process

Source: FEDERAL Organization Service, Military, 1990.

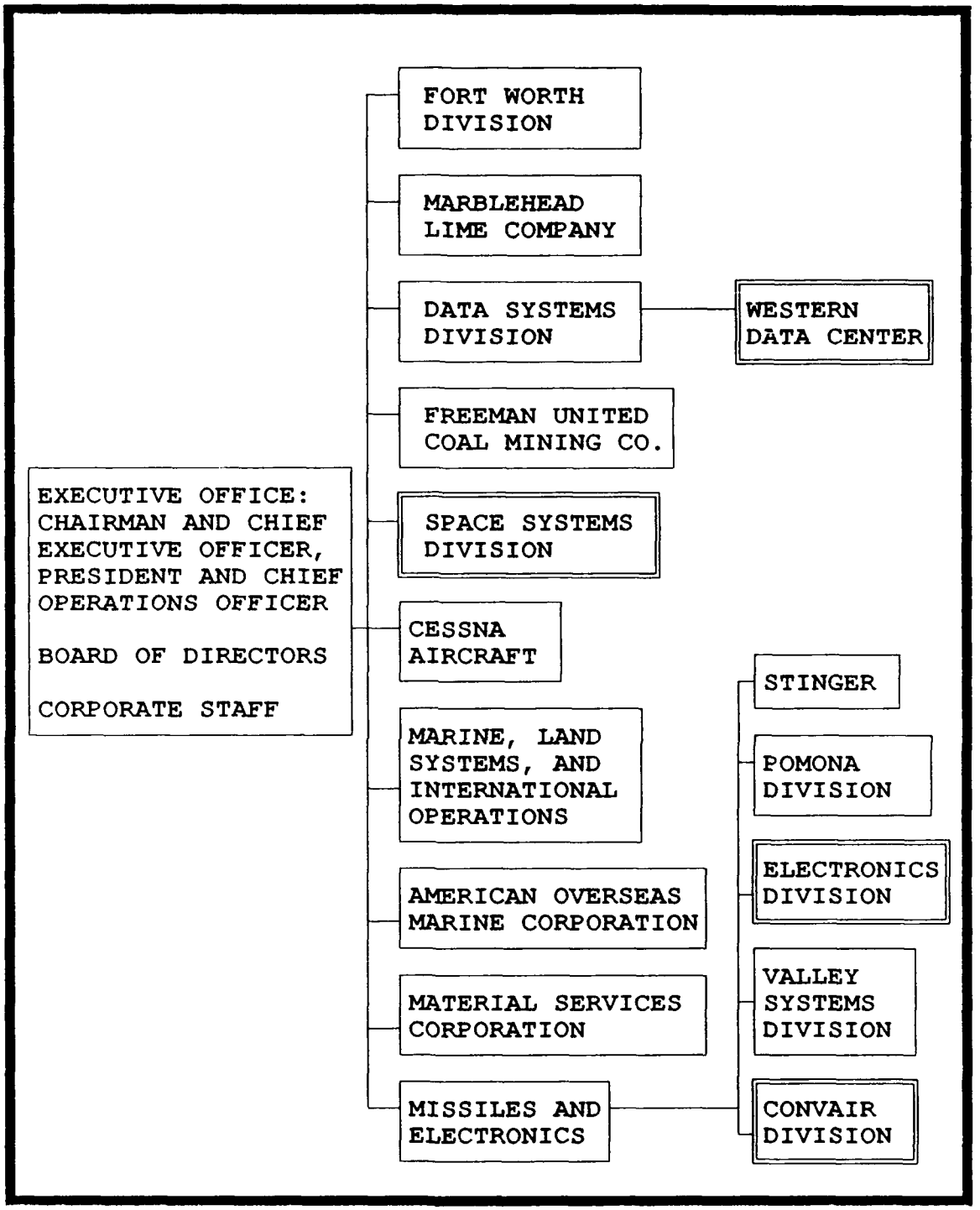


Figure 2. Simplified Organizational Chart for General Dynamics Corporation

Source: FEDERAL Organization Service, Industry, 1990.

### 4. Government and Contractor Responsibilities

The primary purpose of the CRAG Program is to improve contractor internal control systems through self-governance. The government also expects to save money by reducing the number and scope of audits required. Fewer audits mean contractors can assign their employees to more productive work. Ultimately, improved internal control systems result in increased effectiveness and an improved image to the public. The degree to which the government can reduce oversight for a particular CRAG Program area will be determined by the degree to which the government can rely on the contractor's internal controls. Access to and documentation of contractor internal audits is essential to enable government representatives to responsibly and properly evaluate the contractor's procedures and their application.

To facilitate the exchange of information, the ACO will: [Ref. 3:p. 16]

- arrange for the contractor to meet the appropriate DOD oversight officials,
- advise off-site DOD oversight activities of the existence and status of the CRAG Program,
- help identify and prevent duplicative and overlapping oversight, and
- work with the appropriate oversight official to ensure that oversight levels are commensurate with the quality and reliability of a contractor's internal control systems.

The appropriate DOD oversight official will:

- establish with the contractor a coordination process for ensuring that the DOD is fully aware of the contractor's plans and accomplishments,

- integrate the effect of the contractor's efforts into planned oversight activities, and

- inform the contractor and the ACO, through periodic meetings, of the extent to which contractor activities have influenced the scope of DOD oversight.

Contractors participating in the CRAG Program will:

- notify the ACO of the risk areas in which the contractor plans to participate in the CRAG Program,

- describe and document the policies, procedures, and controls that define the system addressing the contractor risk area(s),

- where appropriate, describe and document the contractor's program for training employees in CRAG Program procedures and policies,

- describe and document the mechanism(s) utilized to monitor and test the system,

- demonstrate, in a manner mutually agreed to by the ACO and by the cognizant DOD oversight activity, that the system is functioning as described, and

- maintain continuing surveillance over the internal control system to assure that the CRAG objectives are being met.

## B. AUDIT STANDARDS

The government generally recognizes standards set forth by the American Institute of Certified Public Accountants and incorporates them into the Generally Accepted Government Auditing Standards (GAGAS). The Comptroller General of the United States has pointed out [Ref 21:p. 1-4] that the audit standards are more than a codification of current practices. They represent guidelines for a vital and constantly changing

process. In order to meet the audit demands of a wide variety of programs and services, government auditors must rely on a set of basic premises. In addition, government auditors' interpretation of the CRAG Program policies will be shaped by these premises.

### 1. Basic Premises for Government Auditors

Government auditing standards are based upon and developed on the following premises: [Ref. 21:p. 1-4]

#### *a. Definition of Audit*

An audit may refer to either a financial or a performance audit. Financial audits are generally divided into financial statement and financial related audits. Performance audits are generally divided into economy and efficiency and program audits. In addition to more specific functions, each of these audits determine if those being audited have complied with applicable laws and regulations.

Financial statement audits are used to determine whether or not an audited entity's financial statements present the results of operations, cash flows, financial position or change in financial position fairly and in accordance with generally accepted accounting principles.

Financial related audits determine if other financial reports and items such as accounts or funds have been presented fairly. They also determine if financial information has been reported in accordance with established

or specified criteria and if any specific compliance requirements have been violated.

Economy and efficiency audits are used to indicate if resources are being acquired, protected, and used in an economic and efficient manner. If not, the audit will identify the causes. They are sometimes referred to as functional audits.

Program audits determine to what extent the desired or targeted goals or benefits of a program have been achieved. They also assess the effectiveness of the organizations, programs, activities, or functions involved.

***b. Public Official Responsibility***

Every public official is responsible for the efficient, economic, and effective application of resources for which they have been entrusted. They shall also ensure those resources are used for the purpose for which they were intended.

***c. Public Official Accountability***

Public officials are accountable to both the government and the public.

***d. Internal Control Systems***

An effective internal control system will be established to ensure reliable data are obtained, laws and regulations are observed, resources are safeguarded, and goals and objectives are met.

*e. Laws and Regulations*

It is the responsibility of every public official to know and comply with all applicable laws and regulations.

*f. Availability of Audit Reports*

Audit reports should be made available to the public and to other levels of government which provided resources unless legally prohibited or ethically improper.

*g. Cooperation within the Government*

Government agencies with auditing programs of common interest should cooperate to prevent duplication of audit effort.

*h. Reliance on the Work of Others*

Auditors may rely on the work of others if those performing the work have demonstrated independence, capability, and acceptable performance by appropriate tests or other acceptable methods.

**2. Internal Audit Standards**

Standards form a set of criteria against which an audit function can be evaluated [Ref. 22:p. 14]. The standards were developed by the Institute of Internal Auditors. Although other organizations such as the U.S. GAO have previously developed such standards, the Institute of Internal Auditors' effort represents the first time internal audit standards have been developed to serve all levels of both business and government [Ref. 23:p. 2]. These standards represent a common language between industry and government

which is critical to the success of the CRAG Program. The standards have been divided into five chapters as described below. [Refs. 22:pp. 21-22, 23:p. 2]

***a. Independence***

Internal auditors are expected to be independent of the activities they audit and perform audits in an objective manner. The auditing organization should be sufficient to independently carry out its responsibilities.

***b. Professional Proficiency***

Internal Audits should be performed with proficiency and due professional care. The internal auditing department will ensure that internal auditors have the educational background and technical proficiency necessary to perform the assigned audits. The department shall possess or obtain the knowledge, skills, and disciplines required to perform its audit responsibilities. Auditors will maintain their technical competence through continuing education. They will be skilled in dealing with people and in communicating effectively. Supervision of internal audits shall be provided by the internal audit department.

***c. Scope of Work***

The internal audit should include an assessment of an organization's internal control systems and the quality of performance of those systems.

The means used to identify, measure, classify, and report financial and operating information and the reliability

and integrity of that information shall be reviewed by the internal auditor. It is the internal auditor's responsibility to review the systems established to ensure compliance with policies, plans, procedures, laws, and regulations which could have a material impact on operations and reports. The internal auditor is also expected to verify the existence of all assets, review the means used to safeguard those assets, and appraise the efficiency and economy with which resources are employed.

Finally, the internal auditor will review operations or programs to determine if results are consistent with stated objectives and goals and whether the operations or programs are being performed as planned.

***d. Performance of Audit Work***

Audit work begins with planning, is followed by the actual audit and evaluation, then communication of the results, and finally a follow-up is conducted.

A plan should be prepared for every audit. Internal auditors are expected to collect, analyze, interpret, and document information to support the results of each audit. Follow-up action should be taken by the internal auditor to determine if appropriate action has been taken on reported audit findings.

***e. Management of the Internal Auditing Department***

The director of the internal auditing department is responsible for the proper management of the department.

A statement of purpose, authority, and responsibility for the internal auditing department will be prepared by the director of the department. He should establish plans and provide written policies and procedures to guide the audit staff and establish a program for selecting and developing the human resources of the internal auditing department. The director of internal auditing coordinates internal and external audit efforts; he also establishes and maintains a quality assurance program to evaluate internal auditing department operations.

### 3. When the Government Relies on the Work of Others

The Government Auditing Standards contain specific instructions for reliance upon the work of others. This guidance was primarily intended for cooperation between federal, state, and local governments [Ref 21:p. 3-14]. Since the Packard Commission Report, there has been increased emphasis on cooperation between agencies within the same level of government. The CRAG Program seeks to improve industry's internal audit capability and the degree to which the government can rely on that capability.

#### *a. Relying on External Auditors*

To avoid duplication of effort, a government auditor may want to rely on work already completed by other auditors. For example, the certified public accounting firm of Arthur Andersen & Company has been retained by General Dynamics as an external auditor. Before relying on the

findings of a private firm such as Arthur Andersen & Company, government auditor should: [Ref. 21:p. 3-14]

- make inquiries into the professional reputation, qualifications, and independence of the auditors,
- consider whether to conduct additional tests and procedures such as reviewing the audit procedures followed and results of the audit conducted by other auditors,
- consider whether to review the audit programs of other auditors, and
- consider whether to review the working papers, including their understanding and assessment of internal controls, tests of compliance, and the conclusions reached by other auditors.

#### *b. Relying on Internal Auditors*

When a government auditor wants to rely on the work of internal auditors such as General Dynamics' own corporate auditors, tests should include: [Ref. 21:p. 3-15]

- determining whether they are qualified,
- determining whether they are properly located in the organization in order to provide them with sufficient independence to conduct the audit objectively,
- determining whether their work is acceptable by examining, on a test basis, the documentary evidence of the work conducted,
- conducting tests of the work such as actual or similar transactions, balances, or work the internal auditor examined.

## C. CRAG CHAPTERS

The DOD Contractor Risk Assessment Guide is divided into five areas representing a high risk of contractor error, fraud, waste, and abuse. Each of these areas is called a chapter. As the program expands, other chapters are expected

to be added. Each chapter provides broad guidelines and objectives for that area of the contractor's internal control system. The chapters are not intended to dictate particular procedures or controls which must be used; rather, they explain what an internal control system must accomplish to enable government auditors to rely on the contractor's self-governance efforts. [Ref. 24:p. iii]

1. **Indirect Cost Submissions**

The primary control objective of indirect cost submissions is to provide assurance that U.S. laws and regulations are being adhered to in the preparation and submission of indirect cost claims, proposals, and billings applicable to U.S. government contracts. [Ref. 24:p. 1]

Policies and procedures to allocate allowable costs in billings, claims, and proposals applicable to U.S. government contracts should be established and maintained as stated in FAR 31.2 and Cost Accounting Standards (CAS). Indirect costs and directly associated costs should be properly classified as allowable or unallowable as identified in FAR 31.205, for U.S. government contract costing, billing, and pricing purposes. Indirect costs should be properly allocated to cost objectives in accordance with the FAR and CAS. Reasonable evidence should be provided to indicate that policies and procedures are currently in practice, understood, and effectively implemented by contractor employees.

### 2. Labor Charging

The primary control objective of labor charging is to establish timekeeping and labor charging practices which result in accurate assignment of allowable and allocable labor costs to U.S. government contracts. [Ref. 24:p. 2]

Written policies and procedures should be provided to instruct employees on the proper charging of direct and indirect labor, and to ensure time charged to cost objectives is recorded accurately. A system of internal controls should include: [Ref. 24:p. 2]

- the maintenance of accurate labor cost data,
- the accumulation and recording of labor costs allocable to cost objectives for the purpose of determining proper cost reimbursement on government contracts,
- the verification of labor cost transfers, and
- the segregation of responsibilities for labor related activities.

All employees should receive appropriate training on proper labor charging practices. Timekeeping records should be documented, including authorizations and approvals, to ensure labor hours are being accurately recorded. A system should be in place to verify that labor costs are being properly allocated to cost objectives, and to document and approve labor transfers or adjustments of the labor distribution. Overall integrity of the labor/timekeeping system must be monitored.

### 3. Material Management and Accounting Systems

The primary control objective of material management and accounting systems is to provide internal accounting and administrative controls which will provide assurance of system and data integrity. [Ref. 24:p. 3]

A system description of material management and accounting systems should exist which includes policies, procedures and operating instructions in compliance with the FAR and CAS. A bill of materials and master production schedule should be established to verify that costs of purchased and fabricated material charged or allocated to a contract are based on valid time-phased requirements. A bill of material accuracy of 98 percent and production schedule accuracy of 95 percent are desirable. A mechanism must be provided to identify, report, and resolve system control weaknesses and manual overrides. Audit trails and records must be maintained which enable evaluation of system logic and verification through transaction testing that the system is operating as desired. The material management and accounting system should also establish and maintain an adequate level of physical inventory accuracy. A goal of 95 percent accuracy is desirable.

Manual or system generated transfers of parts must be described in detail. Contractors are required to maintain and disclose a written policy describing transfer methodologies. Costing of material transactions should reveal

a consistent, equitable, and unbiased logic. The system should transfer parts and associated cost within the same billing period. If that is not practical, a loan/payback technique must be approved by the ACO.

The material management and accounting system must provide controls to ensure that physically commingled inventories, which may include materials charged or allocated to fixed price, cost type, and commercial contracts, do not compromise requirements of the previously mentioned controls. Periodic internal audits to ensure compliance with established policies and procedures must be performed.

**4. Estimating Systems**

The primary objective of estimating systems is to provide cost estimates that are current, accurate and complete through the use of appropriate source date, sound estimating techniques, appropriate judgement, maintenance of a consistent approach, and adherence to FAR 15-811, other Federal regulations, and existing company policies and procedures. [Ref. 24:p. 6]

A complete description of the organization, along with duties and responsibilities of personnel who prepare, review, and approve cost estimates, will be provided in writing. Accounting, planning and other functions which contribute to the estimating process will also be provided in writing.

Written guidelines will be developed to ensure estimating source data are applied appropriately which support consistent and verifiable proposals. Compliance reviews will be conducted to ensure estimating system policies and procedures have been implemented, remain current, and are routinely reviewed.

5. **Purchasing**

The primary control objective of purchasing is to ensure adequate purchasing methods are used for the acquisition of supplies and services under the terms of contracts with the Department of Defense. [Ref 24:p. 7]

To develop an adequate purchasing system, policies and procedures should be written to guide employees in the efficient and cost-effective implementation of purchasing practices. An adequate system of internal controls should be developed and implemented. Subcontracts should contain all applicable flow down clauses as required by the prime contract and any additional clauses necessary to perform the requirements of the prime contract.

Effective management is also necessary to ensure appropriate make-or-buy decisions are made, parts and materials are procured from the most responsible/reliable sources at the most economical price, and contractor quality requirements are met. Cost-effective and efficient purchase requirements must be developed and some form of price or cost

analysis must be performed with every purchase action. The overall integrity of the purchasing system must be monitored.

# IV. EFFECTS OF CRAG PROGRAM PARTICIPATION

## A. GENERAL

The primary General Dynamics units in San Diego, California, influenced by CRAG Program implementation include Convair Division, Electronics Division, Space Systems Division, Western Data Center, and the Financial Services Center.

The Convair Division produces three major product lines: the Tomahawk Cruise Missile, Advanced Cruise Missile, and the fuselage for the McDonald Douglas MD-II aircraft. Electronics Division provides support for Convair and Space Systems Divisions on the Cruise Missile and Atlas Centaur Programs. The Electronics Division also produces automatic test equipment and items in support of the F-16 aircraft. Space Systems Division produces the Atlas Missile, performs work on the Titan Centaur, produces launch vehicles for General Dynamics' commercial Launch Services subsidiary, and performs research and development efforts on various space, energy, and advanced programs. The Western Data Center provides data processing services to General Dynamics' San Diego divisions, Pomona, and the Valley Systems Division. The Financial Services Center prepares payrolls, processes travel vouchers, and performs accounts payable services for all west coast and various other General Dynamics divisions.

The Defense Contract Audit Agency (DCAA) is the government organization most significantly impacted by the CRAG Program implementation at General Dynamics' San Diego divisions. The DCAA began its involvement with the CRAG Program at General Dynamics San Diego in April 1989. They held meetings with Convair, Space Systems, Western Data Center, and Electronics divisions to discuss their planned implementation of the five CRAG areas: indirect costs, labor, material management and accounting systems (MMAS), estimating, and purchasing. Since then, DCAA and General Dynamics' San Diego divisions have worked together and made progress in all five CRAG areas. General Dynamics has routinely presented workpaper packages to DCAA which outline the internal controls in place in various CRAG areas. They chose this approach because it describes and documents the policies, procedures and controls which define the system and addresses the CRAG risk area(s).

One major part of DCAA's involvement in the CRAG Program has been coordination with General Dynamics to help them recognize risk areas identified in previously completed DCAA audit reviews and vulnerability assessments. The DCAA has also provided annual audit program plans to ensure that those areas of risk identified receive sufficient coverage. The DCAA's preliminary reviews indicated that the quality of General Dynamics' documentation packages were not consistent. Since this would impact on the DCAA's ability to rely on the documentation, regular meetings were held with internal

auditors and General Dynamics division representatives to ensure that a clear picture of internal audit controls was being presented by the documentation. The involvement of General Dynamics' Vice President in charge of internal auditing and their western region internal audit manager was instrumental in ensuring development of a consistent documentation and presentation approach.

General Dynamics divisions in San Diego quickly discovered that documenting and testing systems covered by the CRAG areas could be a difficult assignment. For instance, General Dynamics' corporate office mandated that every San Diego division would have all five CRAG areas documented by 31 December 1989. The deadline was rescheduled for 31 December 1990. The DCAA estimates that if General Dynamics' San Diego contractors utilize their internal audit staff to develop documentation standards for system descriptions and provide training for the subsequent testing, the 1990 time line might still be achievable for some of the areas. But, despite significant progress, the DCAA contends that realistically, they expect the contractor's efforts on the initial documentation to continue through Fiscal Year (FY) 1991.

General Dynamics' commitment to the CRAG Program and self-governance has carried over into areas which have a direct impact on decreased oversight and related audit hour reductions. The two most significant areas have been

coordinated statistical sampling and coordination of General Dynamics and government audits.

## B. COORDINATED STATISTICAL SAMPLING

In 1988 General Dynamics and DCAA agreed upon sampling plans to be used for annual indirect cost submissions. The samples are used primarily to evaluate the effectiveness of existing internal controls for the identification and segregation of unallowable costs. General Dynamics' San Diego divisions use a stratified statistical sampling approach. This approach is frequently used if there are significant dollar differences between the various costs being reviewed. Indirect cost claims are divided into different categories such as high, medium, and low value. Then samples are drawn based upon the value of claims such as 100 percent of the high value, 40 percent of the medium value, and 10 percent of the low value claims.

A review of the 1985 and 1986 Convair and Electronics Division audit results indicated to DCAA that the divisions' internal controls had been improved and statistical sampling error rates were decreasing. As a result, DCAA reduced budgeted audit hours for the 1987 claims from 750 to 600 in each division for a total saving of 300 hours. [Ref. 25: p. 2]

Space Systems Division was formed in 1987. Based on experience gained from Convair and Electronics Divisions, and considering DCAA's full participation in the 1987 statistical sample at the Space Systems Division, the DCAA resident

auditor decided to decrease his programmed budget from 1450 to 850 hours or a 600-hour reduction. [Ref. 25:p. 2]

The 1987 audits revealed that the San Diego divisions were using the corporate internal audit staff to review their work prior to certification. As a result, DCAA and the internal audit staff were reviewing much of the same work. Since the government's auditors already had knowledge of the quality of the internal audit groups work, they decided to use the internal audit's work on the 1988 claim.

The DCAA San Diego office is also working with the corporate internal audit staff and the divisions to get them to perform all of the Mandatory Annual Audit Requirements (MAARs) reconciliations in order to reduce DCAA's audit effort to testing General Dynamics' internal audit review. Based on the anticipated cooperation, DCAA San Diego expects to save up to 2200 audit hours in FY 1991. While performing audits of General Dynamics' FY 1989 and 1990 overhead claims at the four major divisions, DCAA expects to save the hours by using the corporate internal auditor's work on the overhead claims and by getting General Dynamics' corporate auditors to perform some of the MAARs.

## C. AUDIT COORDINATION

### 1. Electronic Data Processing General Controls

Additional audit resource savings were obtained when DCAA conducted preaudit planning and coordination with General Dynamics' internal audit staff on their functional reviews.

The DCAA performs both functional and program reviews. A functional review checks to see if the contractor is performing in an efficient manner. A program review is intended to determine if the contractor is performing in an effective manner; he is accomplishing the originally intended purpose.

The FY 1990 requirements plan provides an illustration of how audit hours were saved. The DCAA had identified a general controls review as a required audit in FY 1990. The general controls review was budgeted in the DCAA requirements plan at 900 hours to provide adequate coverage for an anticipated electronic data processing program [Ref. 25:p. 3]. Prior to establishing the final hours to be programmed, DCAA representatives held a meeting with General Dynamics' internal audit staff to discuss their planned audits and General Dynamics' planned internal audits for their fiscal year 1990. General Dynamics fiscal year runs from 1 January through 31 December.

General Dynamics' Staff Vice President for Internal Audit attended the meeting and agreed to consider a joint audit with DCAA auditors. The primary reasoning was that DCAA had a requirement to perform this review prior to the March 1990 start of the proposed electronic data processing pilot program. The knowledge gained from this audit about the adequacy of the general controls could be used to determine DCAA's requirements for their electronic data processing

application program reviews. Since General Dynamics was already scheduled to perform this audit as part of the 1989 financial review, it made sense to see if the audit could be done concurrently.

DCAA's Southwestern Region Headquarters coordinated the audits, primarily to ensure that the general control review scope met the requirements of the electronic data processing pilot program. General Dynamics and DCAA auditors agreed to conduct a coordinated audit or joint review which was expected to result in reduced audit hours for both parties. The program plan was developed and DCAA reduced their required hours from 900 to 600 [Ref. 25:p. 3]. Audit programs were exchanged to ensure the audit scope would satisfy the needs of each of the parties. The DCAA's review revealed that the General Dynamics audit program was acceptable.

General Dynamics and DCAA auditors agreed to review selected areas and then each party would review the work of the other to determine the extent of reliance to be placed on the work. General Dynamics was informed that the DCAA planned to issue an audit report to the administrative contracting officer (ACO) and decided to use the DCAA report rather than prepare a duplicate report of their own. The coordination resulted in an expected 100 audit hour reduction. The budget was reduced from 600 to 500 hours. Altogether, the DCAA

expected the joint review to save approximately 400 hours from the original 900-hour budget. [Ref. 25:p. 3]

The audit which was completed in March 1990 took approximately 800 hours or 300 hours over DCAA's final budget. The DCAA attributed the budget overrun to their decision during the review to expand the review to cover General Dynamics' Pomona data centers. General Dynamics Pomona had also been scheduled to conduct a general control review, which was now no longer required, so the joint review actually saved approximately 380 hours: 100 hours for San Diego (900 minus 800) and 280 hours for Pomona. [Ref. 25:p. 4]

The DCAA resident office in San Diego was quick to point out that they had underestimated the hours they thought it would require to complete the audit. They attributed the error to the fact that this was their first joint review and had not realized how long it would take to come to an understanding of definitions and procedures.

On the positive side, the DCAA also pointed out that the audit report was received by General Dynamics in a nonconfrontational manner and the contractor was fully responsive to their recommendations. They attributed this to the support provided by General Dynamics' corporate office. The interface between the auditors also provided excellent training as a fringe benefit. The DCAA staff in San Diego reported that General Dynamics has some very talented electronic data processing auditors and they were very

impressed at the quality of their work [Ref. 25:p. 4]. The cooperation provided hands-on experience which can be expected to improve the quality and uniformity of future joint reviews.

2. **Financial Services Center**

The internal audit program plan coordination meeting held between General Dynamics and the DCAA also identified a planned audit of the newly established Financial Services Center as another possible target for reduced audit scope.

In 1988 General Dynamics established a separate division which it hoped would save money by consolidating accounts payable, payroll, and travel claims processing which were being prepared separately by Convair, Space Systems, Electronics, Western Data Center, Pomona, and Valley Systems Divisions.

There was no substantive knowledge of how effective the internal controls were at the new General Dynamics Financial Services Center. The DCAA's only knowledge was that problems had been encountered as the various divisions shifted the affected financial services to the Financial Services Center.

The government was informed at the internal audit program plan coordination meeting that General Dynamics' auditors were currently performing an internal audit of the Financial Services Center operations. The areas which DCAA perceived as audit risk were discussed and a decision was made to determine if the General Dynamics internal audit provided

adequate coverage to address DCAA's concerns. DCAA also offered to furnish a list of their concerns pertaining to travel claims and the DCAA audit programs for accounts payable reviews and labor. General Dynamics was also informed that the Defense Contract Audit Agency Manual (DCAAM) would be an excellent source of data for evaluating the government's audit concerns. General Dynamics agreed to review the data and provide DCAA with a separate study comparing their audit scope with DCAA's audit guidance to determine if any audit effort anticipated by DCAA could be reduced or eliminated.

The DCAA's San Diego office decided to wait for the results of General Dynamics' internal audit of the Financial Services Center before commencing their own. As promised, General Dynamics' internal auditors met with DCAA in November 1989 to discuss the results of their review. Government and General Dynamics auditors examined the report, the report findings, and a separate study which reconciled their audit scope with DCAA's concerns. The DCAA stated the study was very detailed, including the cross-referencing of audit steps to the workpaper package which was also made available for review. General Dynamics' internal auditors had performed an adequate audit according to DCAA. The government decided to reduce its audit scope to testing of various areas and follow-up of identified problems. The planned budget was reduced from 600 to 200 hours. [Ref. 25:p. 5]

### 3. Material Management and Accounting Systems

The DCAA's planned follow-up reviews on Convair and Electronics, and Space Systems MMAS reviews, provide another example of coordination between the government and General Dynamics' internal audit staff. In their FY 1991 requirements plan, DCAA identified three follow-up reviews based upon deficiencies identified during reviews of General Dynamics' demonstration of compliance with the ten key MMAS elements. The key MMAS elements are discussed in detail in the DOD Contractor Risk Assessment Guide. During a meeting at Convair Division, General Dynamics described the results of their MMAS corrective action plan and informed DCAA that their internal auditors were planning to audit the divisions' actions for compliance with DCAA's recommendations.

DCAA representatives decided to meet with the internal auditors to discuss how the General Dynamics audit could be used to limit DCAA's planned follow-up review. They met and agreed that the internal auditors would perform the follow-up reviews at all three divisions and DCAA would review their work. DCAA had estimated that these audits would require 300 hours each. They now expect to do the follow-ups in about 80 hours each. [Ref. 25:p. 5]

Also at the Convair Division meeting General Dynamics' internal auditors and the DCAA auditors agreed to coordinate all future MMAS audits. DCAA and the internal auditors could

either perform joint reviews or divide audits of the ten key elements to get maximum coverage with less audit resources.

**4. Coordination of Requirements Plan**

On 29 August 1990 the DCAA San Diego staff met with General Dynamics' corporate internal audit staff to discuss DCAA's requirements plan and General Dynamics' proposed requirements plan. The DCAA staff provided the corporate audit group with their FY 1991 requirements plan and their audit workpackage analyses (AWAs). The corporate audit group provided their proposed plan to the DCAA personnel.

A comparison of the two plans revealed areas of audit overlap in labor, billing systems, and estimating. The General Dynamics internal auditors now know where DCAA perceives audit risk and have stated they will use this data to determine where they can assist or even perform some of the suggested audits. The DCAA plans to continue meeting with the internal auditors and will modify their requirements whenever the internal auditors participate in reviews of their identified risk areas.

The DCAA also noted that the internal audit manager asked for some of their AWAs so they could document risk for their own management and tailor some of their audits to address DCAA's concerns. [Ref. 25:p. 6]

## D. FISCAL YEAR 1991 AUDIT REQUIREMENTS PLAN

The DCAA San Diego field audit office (FAO) developed their workload plans and estimated requirements for FY 1991

based on contractor forecasts and operating plans. They also relied on their knowledge of the current contracting environment and its impact on the contractor's projected costs. They compared current requirements to those in prior years, utilized VAPs, MAARS control logs, cost accounting standards (CAS) compliance control schedules, internal control questionnaires (ICQ), audit leads, and AWAs. [Ref. 26:p. 2]

The San Diego DCAA resident auditor has noted that staff requirements have dropped from 34 in 1990 to 27 in 1991, partially due to the CRAG Program. [Ref. 27]

The San Diego FAO has reported a 7.1 percent productivity improvement in their FY 1991 requirements plan. That represents a reduction of 3740 audit hours. The CRAG Program is responsible for 3130 of those hours identified in Table II. [Ref. 26:p. 4]

**E. SUMMARY**

The dramatic results exhibited in Table II reflect initial audit hour savings in only two of the five CRAG Program areas. Coordinated audit efforts of the Material Management and Accounting Systems appear to be achieving similar results. CRAG Program implementation of Estimating Systems and Purchasing are still in progress, but the atmosphere of cooperation is having an impact. For example, a follow-up review of Space Systems' purchasing system is expected to take less than half of the originally scheduled hours as a result

of cooperation between government and General Dynamics personnel. [Refs. 28, 29]

TABLE II.

CRAG PROGRAM FY 1991 AUDIT HOUR SAVINGS

AUDIT HOUR REDUCTIONS BY DIVISION

| AUDIT AREA | CONVAIR | ELECTRONICS | SPACE SYSTEMS | WESTERN DATA CENTER |
|---|---|---|---|---|
| LABOR CHARGING | 400 | 200 | 150 | 320 |
| INDIRECT COST SUBMISSIONS | 410 | 590 | 1120 | 90 |
| TOTALS | 810 | 790 | 1270 | 410 |

TOTAL LABOR CHARGING AUDIT HOURS SAVED: 1070

TOTAL INDIRECT COST SUBMISSION AUDIT HOURS SAVED: 2210

TOTAL AUDIT HOURS SAVED: 3130

Source: General Dynamics Corporation, San Diego Resident Office Narrative for the FY 1991 Requirements Plan, 18 July 1990

The potential benefits of the CRAG Program are just beginning to be realized. The relationship between the government and General Dynamics in San Diego has changed from adversarial to cooperative. As an example, internal auditors for General Dynamics in San Diego recently provided the DCAA

with evidence of an accounting error for which the government was entitled a refund. [Ref. 29]

# V. ANALYSIS

## A. GOVERNMENT AND INDUSTRY RELATIONS

### 1. General

The primary benefit of the CRAG Program identified by this research is the enhanced communication and cooperation which has resulted from an improved relationship between General Dynamics Corporation and the government. The CRAG Program has served as an effective tool for improving the government and industry relationship. Since it is difficult to measure or to quantify the value of a good relationship between government and industry, this section will focus on the problems which result from poor relations. An exaggerated adversarial relationship creates an environment in which meaningful improvements become more difficult [Ref. 29:p. 40]. In May 1990, a senior defense industry executive described the environment between government and industry as follows:

> I have never seen the defense industry the way it is right now. Morale is low, companies are losing hundreds of millions of dollars and there is widespread anxiety about the Defense budget. We are thrust together in a relationship that requires contractors, the Defense Department and Congress to work together. But instead, we operate in an environment of suspicion, fear, and even some danger. [Ref. 30:p. 134]

Another senior defense industry executive described the result of ten years of procurement reform as:

> ...thousands of pages of new rules and regulations, and thousands of auditors, investigators and quality inspectors and support staff...some 22,000 all together,

> and a near doubling of the Defense Contract Audit Agency ...which has produced a climate of confusion, and often an alleged criminalization of that confusion. [Ref. 31:p. 4]

Over half of the top 100 U.S. defense contractors were under investigation for some form of fraud, waste, or abuse in 1988 [Ref. 32:p. 44]. Despite this difficult environment, General Dynamics Corporation is experiencing good relations with the government. Through the CRAG Program, the government and General Dynamics have increased communication with frequent meetings, coordinated their audit planning, and General Dynamics' auditors have independently identified and offered to return incorrect payments [Ref. 27] .

### 2. Impact of Adversarial Relations

Businesses in a free market environment are usually able to withstand an adversarial relationship. Competition usually forces sellers to operate efficiently, offer reasonable prices, and maintain an acceptable level of quality. However, the government and the defense industry often do not operate in a free market environment. A study conducted by the Defense Science Board in 1986 concluded that the acquisition processes used by commercial businesses would not always be effective for use by the government [Ref. 33:p. 23]. The greatest dollar value of defense contracts is allocated to large, expensive systems. In those situations there are only a few sellers. The elimination of any of those suppliers could reduce competition, extend delivery periods and impact military readiness. In 1987 over half of defense

procurement dollars were spent on one percent of defense contracts [Ref. 34:p. 26].

Since the government is the only buyer of many defense industry products, defense contractors may also be harmed by adversarial relations. During the past decade, many major defense contractors found that if they wanted government business, they were required to accept fixed price research and development contracts. It can be argued that these contracts represented an adversarial effort by the government to shift an excessive portion of risk to defense contractors. Such past adversarial policies have extracted a heavy toll from many defense contractors. Seven of the top ten defense contractors have reported heavy losses as a result of fixed price research and development contracts [Ref. 35]. In July 1990, every major American defense contractor, except Boeing, was experiencing an excessive debt ratio [Ref. 36]. As a result of this adversarial environment, companies are less willing to invest in research and productive facilities. Many are divesting themselves of defense contracts altogether, while others are simply going out of business. The consequences are fewer sources of defense products, reduced technological advancement, and increased dependency on foreign suppliers.

An exaggerated adversarial relationship contributes to the public's perception that the defense industry is comprised of "amoral contractors, squeezing profits from sales of

second-rate products." [Ref. 30:p. 134] This perception creates additional, and perhaps misplaced, pressure to reduce defense spending. The public has the right to demand that tax dollars be spent effectively, but distorted perceptions, created by an exaggerated adversarial relationship, may lead to incorrect public choices which could severely limit the nation's ability to defend its interests.

### 3. Government and Contractor Concerns

Some government officials are concerned that the CRAG Program may provide a method for contractors to avoid valid defective pricing charges. For example, a government inspector may be required to provide audit plans which could undermine a five-year-long defective pricing investigation. CRAG Program detractors from the defense industry perceive it from a different perspective. They are concerned that over-zealous government auditors may use additional access to company records to increase and target government oversight. They argue that rather than improving contractor self-governance, the CRAG Program could exacerbate disputes between government representatives and contractors and actually lead to increased oversight [Ref. 37:p. 3]. There has been no definitive evidence to support either concern. As of late July 1990, none of the five largest companies participating in the CRAG Program had experienced increased oversight or suffered strained relations with government auditors as a result of CRAG Program participation. [Ref. 38]

Although a little skepticism is usually considered healthy, decreased CRAG Program participation may be one negative side effect of government and industry concern. The Director of the Defense Contract Audit Agency (DCAA) acknowledged in July 1990 that support for the CRAG Program is far from unanimous. "There are a lot of blockers who are not too enthused about this CRAG Program, both in DCAA and in industry." [Ref. 39]

Sometimes there is good reason for concern when government auditors and defense contractors work closely. George Spanton, a former DCAA manager of operations in Florida, complained:

> ...of pressure from above to "get along." He blamed the situation on the "revolving door," the many documented cases where an auditor or a contracting officer moved into a lucrative job with a contractor, typically upon retiring from government service, after consistently favoring the company soon to be his or her employer. [Ref. 32:p. 46]

There is no evidence of such collusion at General Dynamics in San Diego. The researcher conducted interviews from June through November 1990 with various government and General Dynamics auditors. Each expressed respect for the other, but each also voiced what this researcher would call a healthy skepticism of the other.

There is often a fine line between cooperation and collusion. Since contractors can offer benefits or extract costs from government auditors, they are vulnerable to the contractor's control or "capture." The performance of government auditors may be affected by a number of factors.

For example, the General Accounting Office (GAO) reported the following concerning the National Grain Inspection System:

> While on site, the resident inspector will probably become acquainted with many, if not a majority, of the plant employees on a first-name basis. The longer that the resident inspector remains at the plant, the more he may consider himself a part of the plant's organizational structure. He may even begin to defend the plant against outsiders who raise questions about plant activities. The resident inspector may tend to regard such questions as a reflection on his performance and professional judgement. [Ref. 40:p. 5]

Although illegal, there is still the possibility that those being audited may offer tangible rewards. For example, something as innocent sounding as a Thanksgiving turkey or a bottle of Scotch at Christmas might be offered. Finally, contractors also have the ability to penalize government auditors. They may be uncooperative, complain to the auditor's superiors, and generally make the auditor's job miserable [Ref. 41:pp. 48-58]. The unavoidable conclusion is that even though increased cooperation is desirable, and possibly even mandatory in this time of budget constraints, there are increased risks which are inextricably tied to this new relationship.

## B. MONETARY VALUE OF THE CRAG PROGRAM

Defense audits usually identify between $12 billion and $14 billion in potentially recoverable contractor charges each year. After negotiations and litigation, the government typically recovers between $7 billion and $9 billion. Audit and investigation costs average roughly $1 billion. From the

government's perspective, defense audit programs are clearly worth the investment. [Ref. 42]

The primary objective of the CRAG Program is to improve contractor internal control systems. As internal control systems improve, the government will register savings in oversight expenses. Anticipated fiscal year 1990 audit hour savings by the DCAA at General Dynamics in San Diego were identified in Chapter IV. Other examples include 5,400 defective pricing audit hours saved at McDonnell Aircraft Company and over 2,700 overall audit hours saved at Martin Marietta Astronautics Group [Ref. 43]. These reduced hours benefit the government, but coordinated and cooperative audit efforts often reduce the contractor's audit requirements as well. More significant, but not directly identifiable, savings may occur as a result of contractors' improved internal control systems. These are the benefits accrued from reduced waste, fraud, abuse, and from increased effectiveness.

Perhaps the most significant and immediate benefit to participating contractors comes in the form of early contract close-out. In recent years DCAA auditors have been overwhelmed by the volume of work assigned. For example, a DCAA audit staff of 34 was called for at General Dynamics' San Diego divisions in FY 1990. Staff requirements are determined by a standard formula which is based on dollar volume, the number of contracts handled, and the number of mandatory annual audit requirements (MAARs). Due to budgetary

constraints a staff of 26 was assigned. The staff was forced to concentrate on areas of greatest risk to the government. Some audits which were preventing contract close-outs had to be postponed. Self-governance initiatives such as the CRAG Program have enabled the DCAA staff to complete several years of backlog. The resulting final payments released to General Dynamics represent millions of dollars and a significant monetary inducement to continue their self-governance efforts. [Ref. 27]

## C. SUMMARY

Since beginning their implementation of the CRAG Program, General Dynamics' San Diego Divisions have experienced good relations with the government, improved their internal control systems, and enabled government auditors to reduce and reassign audit efforts. It would appear the CRAG Program is responsible for these developments, but other activities within the corporation may have played a larger role.

In 1986, General Dynamics Corporation established four goals to accomplish effective self-governance:

- develop and implement a strong ethics program,
- tolerate zero defects in administrative processes,
- initiate a corporate management effectiveness program which would annually review the operational effectiveness of corporate policy, and
- expand the charter for the internal audit staff to include all aspects of contract compliance.

By 1988, General Dynamics was actively seeking ways to improve relations with the government. The CRAG Program provided an excellent tool to accomplish their goal. General Dynamics estimates that implementation through the demonstration phase required, or will require, up to 13,000 man hours per division. In total, they expect to expend 45 man-years of effort for ten divisions. [Ref. 44]

General Dynamics has clearly committed its resources and its policy to the concept of self-governance. In San Diego, the CRAG Program has proven to be an effective approach. However, the CRAG Program is not exclusively responsible for the improved relations and reduced audit hours identified. The commitment of General Dynamics Corporation to the ideals of self-governance and the pro-active attitude and cooperative spirit of the DCAA San Diego resident audit staff are equally responsible for the achievements.

# VI. CONCLUSIONS AND RECOMMENDATIONS

## A. CONCLUSIONS

Tne Department of Defense (DOD) CRAG Program is an effective method to promote self-governance in the defense industry. It is of little value without the commitment of both government and industry. The program represents a means to attain the desired goal of improved contractor internal control systems.

The CRAG Program has helped reduce duplication of audit effort, enhanced training, and improved relations between government audit agencies and General Dynamics divisions in San Diego. In addition to the early success enjoyed by General Dynamics, other major defense contractors including Martin Marietta Corporation, General Electric Company, McDonnell Douglas Corporation, and Unisys Defense Systems have reported similar experiences. Despite significant progress at these and other defense companies, many contractors still do not fully support the program. Government proponents have been disappointed with the degree of industry support, as reflected in the following quotes from the DCAA's Assistant Director for Policy and Plans and the Under Secretary of the Defense for Acquisition:

> In view of such active effort, it becomes disheartening to hear the same tired complaints that industry raised before there were concrete successes in the CRAG area. [Ref. 14]

> If we are to improve the oversight process and reduce the burden we must be able to demonstrate clearly that the change is both needed and will not reduce the necessary protection of the government's interests. I am concerned about our ability to do so when...voluntary programs like CRAG and DII (Defense Industry Initiatives) are not enthusiastically embraced by the defense industry. [Ref. 45]

Self-governance programs such as CRAG provide enormous opportunity to enhance defense contractor performance, reduce and improve government oversight, cultivate better government/industry relations, and improve the public image of defense contractors. In this era of intense public scrutiny and budgetary constraint, a negative defense industry image could lead to reduced funding and a dangerously diminished defense capability.

## B. RECOMMENDATIONS

Both General Dynamics and the government have gained from an atmosphere of increased contractor self-governance in San Diego. It is not clear that the benefits accrued from the CRAG Program to date are greater than the invested costs. However, it is clear that the benefits to both government and industry will continue to grow as costs remain relatively constant. The DOD should continue to actively support contractor self-governance through initiatives such as CRAG, In-Plant Quality Evaluation (IQUE), and the Responsible Supplier Verification Program (RSVP).

Many defense contractors are confused by the number of self-governance programs available and the associated requirements, benefits and costs of each. Contractors tend to support the concept of self-governance but often resist individual self-governance programs which they view as additional requirements and believe will expand government oversight. The DOD should place greater emphasis on the concept of self-governance and promote initiatives such as CRAG, IQUE and RSVP as self-governance techniques rather than as independent programs.

Audit agencies are naturally inclined to identify contractor deficiencies. They are not generally organized to recognize and reward activities other than the normal audit functions. As a result, audit agency personnel who spend considerable time and energy helping contractors to improve internal control systems may not receive proportionate recognition for their efforts. The DOD should establish appropriate rewards and recognition for those officials who successfully assist contractors to improve their internal control systems.

## C. ANSWERS TO THE RESEARCH QUESTIONS

To what extent is the CRAG Program achieving the goal of improved DOD oversight processes and more effective contractor internal control systems?

At General Dynamics in San Diego, government auditors have identified measurable improvement in each of the CRAG internal control areas being implemented. Joint audit planning has enabled the DCAA to more effectively allocate resources and to settle a substantial backlog of overhead audits. Other major defense contractors including McDonnell Douglas, Unisys Defense Systems, Martin Marietta Corporation, General Electric Company, and General Motors' Hughes Aircraft Company have experienced similar success. DOD oversight processes and contractor internal control systems have improved significantly at those locations and in those areas where the CRAG Program has been implemented. However, those areas represent a very small portion of internal control systems in the defense industry.

What are the essential features of the CRAG Program as it currently exists and how has the program been implemented?

The CRAG Program is a technique to improve contractor internal control systems and government oversight processes. Five internal control areas of high risk have initially been identified: labor charging, material management and accounting systems, indirect cost submissions, estimating systems, and purchasing. The minimum requirements for an effective control system, in each of the five CRAG areas, were developed by a joint team of government and industry representatives. Program implementation is coordinated by the administrative contracting officer (ACO). Participating

contractors work through their ACO to develop and demonstrate internal control systems which can be relied upon by the government.

To what extent has the CRAG Program changed the internal control systems of General Dynamics' San Diego divisions?

First, the internal control systems focus more on areas of greatest concern to the government. Second, they report their findings in a manner which is usable by government auditors. Finally, the CRAG Program provides an excellent source of training to the General Dynamics internal audit staff.

To what extent has the CRAG Program changed Department of Defense oversight for General Dynamics' San Diego divisions?

Government oversight by the DCAA is scheduled to be reduced by over seven percent in fiscal year (FY) 1991. Reduced oversight requirements in FY 1990 were used to liquidate a four-year backlog of overhead audits.

What benefits and costs have resulted from the CRAG Program at General Dynamics' San Diego divisions?

The relationship between the government and General Dynamics' divisions in San Diego has improved significantly. Government audit agencies have been able to assign their assets more effectively and complete audits which allow contracts to be closed. In most cases, upon contract close-out, General Dynamics receives a final payment. General Dynamics estimates the cost for implementation of the five

CRAG areas, through the demonstration phase, to be between 3,000 and 13,000 man hours per division.

Which elements of the CRAG Program at participating General Dynamics divisions are common to all CRAG participants?

The ACO is the primary point of contact for the initiation and coordination of the CRAG Program. The general guidelines provided in the CRAG manual are the same for all participants. There are no specific ground rules which apply to all contractors. The internal control system requirements may vary depending on considerations such as the nature of the business, the operational and management structure, the type and cost of the product produced, and the geographic location of facilities.

What inferences may be made from the experiences of General Dynamics' San Diego divisions which could be used by other contractors wishing to implement the CRAG Program?

The contractor's internal audit staff should be utilized to determine the areas of key importance to the government. The audit staff should then train division personnel to document internal controls to ensure they may be relied upon by the government. Establishing an effective CRAG Program takes dedication, time, and the support of corporate management.

What level of support has been demonstrated for the CRAG Program by government and industry?

The government believes fully in the CRAG Program and has demonstrated its support repeatedly in articles, at conferences, and through the leadership of officials including the Under Secretary of the Navy for Acquisition, DOD Comptroller General, DOD Inspector General, Director of the Defense Contract Management Command, and the Director of the Defense Contract Audit Agency. Less than 20 major defense contractors are actively participating in the CRAG Program. Major industry organizations such as the Council of Defense and Space Industry Associations (CODSIA) support the CRAG Program but have had little success enlisting the support of smaller contractors who believe the costs of the CRAG Program outweigh the benefits. Despite the slow start, support continues to grow.

## D. AREAS OF FURTHER RESEARCH

The CRAG Program in San Diego has provided significant benefits to the government. Increased knowledge of General Dynamics' internal control systems has helped government auditors focus on critical areas and assign personnel more effectively. The DCAA audit staff in San Diego has already reduced projected audit hours by over 7 percent and budgeted manpower requirements by over 20 percent for FY 1991. The benefits to General Dynamics are not as clear. At the time of this research, only two of five CRAG Chapters had been implemented to any significant degree. General Dynamics'

estimates of CRAG Program costs varied by up to 400 percent. As more data becomes available, additional research in the form of a cost/benefit analysis would be useful in determining the overall utility of the program.

One of the early and clear benefits of the CRAG Program has been improved communications and relations between government and industry. This researcher has observed a quality of training and communication, between government agencies and General Dynamics in San Diego, which will greatly reduce the probability of procurement scandals similar to those reported in recent years. Some industry analysts believe that negative public opinion caused by procurement scandals will have a significantly adverse impact on defense spending. Additional research which tracks public opinion and major defense scandals in relation to defense funding may provide evidence to either support or refute this hypothesis.

## APPENDIX A

## LIST OF ABBREVIATIONS

| | |
|---|---|
| ACO | Administrative Contracting Officer |
| AIA | Aerospace Industries Association |
| AICPA | American Institute of Certified Public Accountants |
| AWA | Audit Workpackage Analysis |
| BOM | Bill of Materials |
| CAC | Contract Audit Coordinator |
| CAS | Cost Accounting Standards |
| CODSIA | Council of Defense and Space Industry Associations |
| CPSR | Contractor Purchasing System Review |
| CRAG | Contractor Risk Assessment Guide |
| DAB | Defense Acquisition Board |
| DAE | Defense Acquisition Executive |
| DAGPIR | Defense Advisory Panel for Government/Industry Relations |
| DCAA | Defense Contract Audit Agency |
| DCAAM | Defense Contract Audit Agency Manual |
| DCMC | Defense Contract Management Command |
| DFARS | Department of Defense FAR Supplement |
| DII | Defense Industry Initiatives |
| DLA | Defense Logistics Agency |
| DODIG | Department of Defense Inspector General |
| DPRO | Defense Plant Representative Office |

| | |
|---|---|
| EDP | Electronic Data Processing |
| EIA | Electronic Industries Association |
| FAO | Field Audit Office |
| FAR | Federal Acquisition Regulation |
| FY | Fiscal Year |
| GAGAS | Generally Accepted Government Auditing Standards |
| GAO | General Accounting Office |
| IAA | Institute of Internal Auditors |
| IQUE | In-Plant Quality Evaluation |
| MAARs | Mandatory Annual Audit Requirements |
| MMAS | Material Management and Accounting System |
| NCMA | National Contract Management Association |
| OMB | Office of Management and Budget |
| OSD | Office of the Secretary of Defense |
| RSVP | Responsible Supplier Verification Program |
| SECDEF | Secretary of Defense |
| USDA | Under Secretary of Defense for Acquisition |
| VAPS | Vulnerability Assessment (Procedures) |

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